

The risk factor associated with clavicle fracture in infants with congenital muscular torticollis

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Objective

Congenital muscular torticollis (CMT) has known to be able to occur along with several conditions, such as brachial plexus injury (BPI) or clavicle fracture. Among them, there has been little study about the risk factor of clavicle fracture combined with CMT, although clavicle fracture is the most common fracture in newborns. Therefore, the aim of this study is to investigate the relationship between demographic factors and clavicle fracture combined with CMT.

Material and method

The medical records of 449 subjects who complained of abnormal posture of head and neck were reviewed. Exclusion criteria were (1) no specific finding on ultrasonography; (2) diagnosed as postural torticollis; (3) no plain radiograph of cervical spine and/or clavicles. And 134 patients of CMT were included. Therefore, we retrospectively reviewed the medical records of 134 patients with CMT. Clavicle fracture was confirmed when fracture line and/or callus were detected on the plain radiography. Demographic data, such as body weight, maternal age, gender, gestational age, delivery method, sternocleidomastoid (SCM) thickness of ipsilateral side, and its ratio between ipsilateral and contralateral side, and first visit date after the birth were collected by reviewing medical record. To find the difference of the demographic data between CMT patients with and those without clavicle fracture, an independent T-test, Fisher`s exact test, or chi-square test were performed. In addition, multivariate logistic analysis was then performed on the demographic factors with a p-value less than 0.05 in independent t-test, Fisher`s exact test, or chi-square test.

Results

Clavicle fracture was found in 15 of 134 patients with CMT, with the concurrent rate being 11.19%. In comparison of the demographic data between CMT patients with and those without clavicle fracture, there was a significant difference in delivery mode (P-value <0.05). There was a significant difference in body weight between CMT patients with and those without clavicle fracture (P-value <0.05). However, there was no significant difference in other demographic factors. In multivariate logistic analysis, the body weight was the only significant parameter for predicting clavicle fracture in patients with CMT (p-value <0.05). In patients with CMT, the area under the ROC curve of the body weight for predicting clavicle fracture was 0.659 (95% CI, 0.564-0.745.; p<0.05). The optimal cut-off value obtained from the maximum Youden index J was 3470g (sensitivity:

57.14%, specificity: 75.76%), and the odd ratio of clavicle fracture in patients with CMT increased by 1.244 times at every 100g of body weight.

Conclusion

Body weight at birth can be a clinical predictor of clavicle fracture in patients with CMT. Therefore, care should be taken to detect clavicle fracture when the body weight at birth is more than 3470g in patients with CMT.